The purpose of this research project is to analyze the likely economic impacts of climate change on disadvantaged communities in the San Joaquin Valley in the context of pending regulations and changing resource conditions.

Background

Agriculture provides employment and income to thousands of households in the agriculturally prominent San Joaquin Valley (SJV). Farm labor often comes from disadvantaged communities (DAC) who rely on agriculture as their main income source. At the same time, agriculture has major impacts on rural water systems' quality and quantity. Changes in land use, climate extremes, groundwater overdraft, and soil salinity accumulation may exacerbate impacts on farmlands and hence employment and income in rural communities. Additional issues include a more volatile water supply for irrigation, decreasing chill hours, and increasing soil salinity and soil subsidence. These environmental risks may affect farm labor in some disadvantaged communities that often times lack of safe drinking water. This project will identify linkages between agriculture, environmental risks, quality of life and employment stability for rural disadvantaged communities within the San Joaquin Valley.

Hypothesis

Our research hypothesis is that these factors create important and often overlooked tradeoffs that affect future costs and opportunities for SJV and DACs under a changing climate. We are interested in exploring the link between:

1. Water resources that support SJV farming.
2. The economic wellbeing of DACs that depend on farm jobs.
3. The effect of climate change and SGMA requirements on SJV water resources.

Quantitative and Modeling Aspects

- Develop economic model of subbasin agriculture and water supply.
  - Future water availability over a set of overdrafted subbasins in the SJV calculated with Net To/From Groundwater Method
  - Regional modeling and changes in farm production will be developed using the Statewide Agricultural Production (SWAP-RTS) model
- Compare scenarios using the economic model.
  - Scenario 1: Baseline
  - Scenario 2: Baseline with SGMA
  - Scenario 3: Baseline with SGMA & Climate Change
- Estimate the direct and unintended consequences of climate change and SGMA on the agricultural footprint in the subbasin.
- Evaluate policies to minimize economic costs.

DAC and Stakeholder Outreach

- Conduct outreach with subbasin stakeholders.
- Implement surveys, interviews, and workshops within DAC's in partnership with agricultural groups.
- Analyze well-being of DACs within the SJV.
  - Population, demographic data, public health information, and housing availability

Implications for Tule Subbasin Dairy Farms

- Any impacts caused by SGMA will have ripple effects in the local economy.
- Impacts will be greatest in areas that are groundwater-dependent.
  - Areas with no access to surface supplies have more limited management options under SGMA and land idling may be greater.
  - Areas with access to alternative water sources may see the cost of water increase to fund projects.
- Dairies in the Tule Subbasin are concentrated in the Lower Tule River GSA and the Pixley GSA.
  - Each is subject to similar pumping restrictions; however, the Lower Tule River GSA has significant amounts of surface water, the Pixley GSA does not.
  - Applied water may fall around 30% in the LTR GSA, and 60% in the Pixley GSA.
- Without limiting silage removal in the economic model, silage makes up the largest share of falling.
- Dairies have some ability to import feed at an additional cost. However, dairies may have limited options to manage wastewater.

Major policy implications:

1. Impact on DACs, impact on SJV agriculture, and the future of the SJV.
2. Indirect/unintended outcomes under SGMA and climate change.

The developed models will not only be used to simulate the impact of climate change policies on employment in the DACs, but this research creates a baseline for future work. The developed models can be easily updated to include more data and are flexible in their ability to analyze different policies that address climate change as they are developed.

The Future of San Joaquin Valley Agriculture Under Climate Change and SGMA is part of California Climate Investments, a statewide initiative that puts billions of Cap-and-Trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.